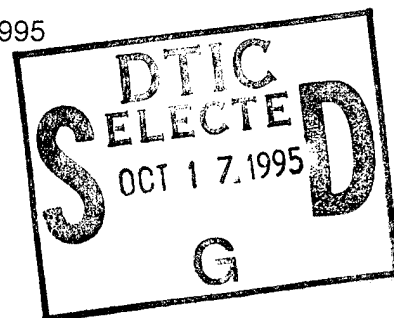


ADVANCED  
FUEL  
RESEARCH



P. O. Box 380379  
East Hartford, Connecticut 06138-0379  
Telephone (203) 528-9806  
Fax (203) 528-0648

April 11, 1995



Donald Liebenberg, ONR 312  
Office of Naval Research  
Ballston Tower One  
800 North Quincy Street  
Arlington, VA 22217-5660

Re: Contract No.: N00014-94-C-0261, "HTS Josephson Technology on Silicon with Application to High Speed Digital Microelectronics"

Dear Mr. Liebenberg:

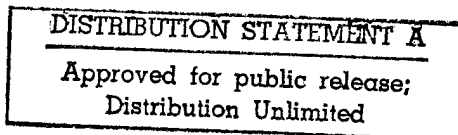
Enclosed is a copy of the Progress Report (0001AF) and Form DD 250 for the above referenced contract.

If you have any questions or if I can be of further assistance, please call me at (203) 528-9806, ext. 130.

Sincerely,

Susan A. White  
Administrator of Contracts  
and Proposals

Enc.



Copies to (per contract):

- 1 Rebecca A. Taylor, Contracting Officer
- 1 Director, Naval Research Laboratory
- 2 Defense Technical Information Center

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## MONTHLY PROGRESS REPORT

### "HTS Josephson Technology on Silicon with Application to High Speed Digital Microelectronics"

Contract No: N00014-94-C-0261  
Office of Naval Research, Arlington, VA  
April 11, 1995  
Report No.: (0001AF)  
Report Period: March 1 - March 28, 1995  
Contract Period: September 30, 1994 - September 29, 1995  
Principal Investigator: Peter Rosenthal  
AFR No: 531001

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DTIC	TAB <input type="checkbox"/>
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#### Summary of Progress

##### Task 1: Junction fabrication and testing

The last chip, described in the previous monthly report, demonstrated that the Stony Brook scientists were able to fabricate working junctions and SQUIDs from thin YBCO films fabricated on silicon substrates. It was observed that the junctions were not well matched in critical temperatures. This non-uniformity is primarily attributable to non uniformities within the films. To improve the film uniformity, and to accomodate the demands of other projects, we built a new substrate heater for the deposition system, that would provide more uniform temperatures over larger substrate areas. The new heater was built to allow deposition onto 12 mm square chips, which can subsequently be diced into 4 5 mm square chips. With this arrangement, it should be possible to fabricate and test many more junctions from a single deposition and gather more and better statistics on junction properties.

During this month, the AFR PLD facility was down for several weeks while a new substrate heater was installed and broken in. Only one film was sent to Stony Brook for fabrication experiments. They are presently working on fabricating junctions from this chip.

##### Task 2: Junction modeling

No work was performed in this task.

##### Task 3: RSFQ device fabrication

No work was performed in this task.

  
Peter A. Rosenthal, Senior Physicist



OFFICE OF THE UNDER SECRETARY OF DEFENSE (ACQUISITION)  
DEFENSE TECHNICAL INFORMATION CENTER  
CAMERON STATION  
ALEXANDRIA, VIRGINIA 22304-6145

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SUBJECT: Distribution Statements on Technical Documents

TO: OFFICE OF NAVAL RESEARCH  
CORPORATE PROGRAMS DIVISION  
ONR 513  
800 NORTH QUINCY STREET  
ARLINGTON, VA 22217-5660

1. Reference: DoD Directive 5230.24, Distribution Statements on Technical Documents, 18 Mar 87.
2. The Defense Technical Information Center received the enclosed report (referenced below) which is not marked in accordance with the above reference.
- PROGRESS REPORT ADVANCE FUEL  
RESEARCH  
N00014-94-C-0261  
TITLE: HTS JOSEPHSON  
TECHNOLOGY ON SILICON WITH  
APPLICATION TO HIGH SPEED DIGITAL
3. We request the appropriate distribution statement be assigned and the report returned to DTIC within 5 working days.
4. Approved distribution statements are listed on the reverse of this letter. If you have any questions regarding these statements, call DTIC's Cataloging Branch, (703) 274-6837.

FOR THE ADMINISTRATOR:

1 Encl

GOPALAKRISHNAN NAIR  
Chief, Cataloging Branch

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The cited documents has been reviewed by competent authority and the following distribution statement is  
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A  
(Statement)

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ONR 300  
800 QUINCY STREET  
ARLINGTON, VA 22217-5660

\_\_\_\_\_  
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Shirley Hughes  
(Signature & Typed Name)

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City, State, Zip)

19 SEP 1995  
5

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(Date Statement Assigned)